

TECHNICAL PAPER INDEX

1.1.1 Automotive

EUROPE 92: IS QUALITY SYSTEM REGISTRATION ENOUGH?	2
Douglas L. Berg , Powertrain Div.-General Motors, Ypsilanti, MI	
William M. Harral , Arch Associates, Northville, MI	
LCS: 020:70:000	
ESTIMATING C _p k ACCURACY	9
Barbara Price, Kelly Price , Assoc. Professors, Business School, Wayne State University, Detroit, MI	
LCS: 123:70:400	
SHEWHART CHARTS & PRE-CONTROL: RIVALS OR TEAMMATES?	16
Tripp Martin , Director of Quality, Peterson Spring, Southfield, MI	
LCS: 110:70:400	

1.1.2 Chemical & Process Industries

A SEQUENTIAL 3-PHASE PROCESS IMPROVEMENT STRATEGY	23
Norman M. Edelson , New Process Development Manager	
Melinda L. Ellis , Process Technology Manager	
Anil N. Kharkar , Manager, Process Engineering and Analysis, Senior Engineering Associate	
Brian E. Stutts , Manager, Process Engineering and Analysis, Corning Inc., Corning, NY	
Suzanne deTreville , Consultant, Espoo, Finland	
LCS: 310:20:400	
PARAMETER DESIGN EXPERIMENTS IN FOUNDRY PROCESSES	30
Robert G. Batson , Professor of Industrial Engineering, The University of Alabama, Tuscaloosa, AL	
J. Fred Phillips , Process Control Engineer, American Cast Iron Pipe Co., Birmingham, AL	
LCS: 520:70:443	
SMALL SAMPLES AND NON-NORMAL CAPABILITY	37
Gordon K. Constable , Wright State University, PQ Systems	
Jon R. Hobbs , Wright State University, Dayton, OH	
LCS: 123:70:400	

1.1.3 Computer Information

COMPUTER INFORMATION SYSTEMS QUALITY: FROM COMMITMENT TO REWARD	44
Louise Fuller Pinter , Systems Consultant, AFLAC, Columbus, GA	
LCS: NONE	
AGGREGATED FUNCTION FOR COMPLEX QUALITY ASSESSMENT	50
Konstanty Rogalinski, Vincent Lo , California Cedar Products, Stockton, CA	
LCS: NONE	
DESIGNING PERFORMANCE MEASURES FOR PRODUCTIVITY AND CUSTOMER SATISFACTION	57
J. Ronald Burbank , Management Analysis Company, San Diego, CA	
LCS: 700:10:800	

1.1.4 Customer-Supplier

HEARING, SEEING, AND TOUCHING YOUR CUSTOMER'S PROCESS	64
David M. Saunders , Director, Total Quality Management, ARBOR, Inc., Media, PA	
LCS: 350:40:000	
A TWO YEAR, 50% SUPPLIER BASE REDUCTION PLAN	71
(An Enabling Process for Troubled Manufacturers)	
Alvin Kitlica , President and CEO, Quality Applications, Inc., Scottsdale, AZ	
LCS: 650:70:400	

1.1.5 Quality Management	
TRAINING—AN ONGOING COMMITMENT IN THE FUTURE	79
William O. Winchell, Visiting Associate Professor, Purdue University, Warren, MI	
LCS: 320:10:000	
ZBM PCB: AN INTEGRATED TEACHING CASE IN QUALITY	86
Glenn W. Milligan, Professor of Management Sciences	
Sharon L. Zink, Reza Barkhi, PhD Candidates, The Ohio State University, Columbus, OH	
LCS: 323:70:400	
OPTIMIZING QUALITY COST WITH THE LOSS FUNCTION	93
Henry H. Wong, Quality Specialist, Polysar Rubber Corp., Sarnia, Ontario, Canada	
LCS: 353:60:430	
1.1.6 Inspection	
AN AYE FOR INSPECTION	100
F.J. Cullen, F.J. Cullen Associates, Millersville, MD	
LCS: 760:70:000	
FAIL-SAFE MANUFACTURING FOR ASSEMBLY OPERATIONS	107
William Binroth, Director, Quality Systems, Siemens Automotive, Auburn Hills, MI	
LCS: 720:70:000	
RELATING CMM DATA TO DESIGN SPECIFICATION	116
Utpal Roy, Xuzeng Zhang, Department of Mechanical and Aerospace Engineering, Syracuse University, Syracuse, NY	
LCS: NONE	
1.1.7 Human Resources	
HUMAN RESOURCE INVOLVEMENT IN CORPORATE QUALITY	124
David F. Bush, Professor, Villanova University, Villanova, PA	
David W. Danner, Director of Organizational Planning and Development, Hahnemann University and Hospital, Philadelphia, PA	
Gail Morgenstern, Morgenstern Associates, Narberth, PA	
Antoinette K. O'Connell, Chairman, Training Professionals, Inc., Philadelphia, PA	
LCS: NONE	
WORTH EVERY PENNY: A PROCESS TO EVALUATE TRAINING	129
Jane Holcolmb, On-Target Training, Playa del Rey, CA	
LCS: 323:00:000	
CRISIS IN TRAINING	136
Bettina L. Karlove, President, Vanguard Consulting, Bartlett, IL	
LCS: 320:10:000	
1.1.8 Statistics	
UPGRADING PRODUCT AND PROCESS DESIGN DEVELOPMENT TOOLS	143
Hongru Shen, Sant R. Arora, Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN	
LCS: 660:60:400	
ACCREDITING A MACHINE FOR A LIFETIME OF QUALITY	151
David H. Middleton, Quality Assurance Engineer, Eastman Kodak Co., Professional Film Manufacturing, Rochester, NY	
LCS: 123:70:400	
POISSON GREEN M&Ms ATTRIBUTE CHARTING SIMPLIFIED	158
Bill L. Wortman, Principal, Quality Council of Indiana, Terre Haute, IN	
LCS: 112:70:000	

1.2.1 Automotive	
AUTOMOTIVE QUALITY REQUIREMENTS STANDARDIZATION	165
Bruce W. Pince, Senior Vice President, Sandy Corp., Troy, MI	
Russell M. Jacobs, Senior Manager, Component Procurement and Supplier Development, Chrysler Corp., Detroit, MI	
Alice A. Miles, Staff Procurement Analyst, Ford Motor Co., Dearborn, MI	
Joseph R. Phelan, Executive Director, Automotive Industry Action Group, Southfield, MI	
R. Dan Reid, Manager of Supplier Development Administration, General Motors Corp., Detroit, MI	
Radley M. Smith, Corporate Staff Quality Engineer, Ford Motor Co., Dearborn, MI	
LCS: 352:90:437	
A CAPABILITY STUDY FOR AN ENTIRE PRODUCT	172
Davis R. Bothe, President, International Quality Institute, Inc., Northville, MI	
LCS: 111:70:400	
PROBLEMS WITH GAUGE R&R STUDIES	179
Donald J. Wheeler, Statistical Process Controls, Inc., Knoxville, TN	
LCS: 710:70:400	
1.2.2 Chemical & Process Industries	
WHAT IS CAPABILITY? WHAT IS C_p AND C_{pk} ?	186
John C. Finley, Quality Engineer, GenCorp Automotive, Design & Engineering Center, Wabash, IN	
LCS: 123:60:400	
TOTAL PERFORMANCE WORK SYSTEMS AND TOTAL QUALITY	193
John S. Bingman, Director, Quality Assurance, J.T. Baker Inc., Phillipsburg, NJ	
LCS: 330:10:428	
GETTING OPERATORS TO REALLY USE SPC; MCPs CAN HELP	201
Robert D. Foster, Senior Engineering Scientist	
Wayne E. Zirk, Senior Statistician, Union Carbide Chemicals and Plastics Company, Inc., South Charleston, WV	
LCS: 100:70:428	
1.2.3 Computer Information	
ASSESSING AND IMPROVING THE QUALITY OF DATABASES	208
Pam Clayton, Data Analyst, Kevin Kenward, Director, Department of Professional Activities Information, American Medical Association, Chicago, IL	
LCS: 730:70:886	
QUALITY IMPROVEMENT IN INFORMATION SYSTEMS	216
Donald L. Ballard, Information Systems Manager	
Anita L. Boland, IS Quality Improvement Administrator, Boeing Petroleum Services, Inc., New Orleans, LA	
LCS: 640:10:000	
ENTERPRISE-WIDE COMPUTER INFORMATION SYSTEMS.....	223
Thomas Richards, Clive C. Sanford, Business Computer Information Systems, College of Business Administration, University of North Texas, Denton, TX	
LCS: 340:10:000	
1.2.4 Customer-Supplier	
MOST VENDOR CERTIFICATION METHODS ARE TRIVIAL	230
Keki R. Bhote, Senior Corporate Consultant, Quality and Production Improvement, Motorola Inc., Schaumburg, IL	
LCS: 351:40:000	
ARE YOU SURE YOU'RE MEETING YOUR CUSTOMER'S NEEDS?.....	237
Raymond J. Mikulak, President, Resource Engineering, Inc., Vernon, CT	
LCS: 345:50:000	

1.2.5 Quality Management

BEYOND INTERNAL CUSTOMERS: A QUALITY PARTNERS MODEL	244
W. Wade Martin , User Satisfaction Engineering, Inc., Rockville, MD	
James M. Toney Jr. , Tracor, Inc., Arlington, VA	
LCS: 310:10:000	
MANAGING SPC, A CRITICAL QUALITY SYSTEM ELEMENT	251
Peter D. Shainin , Shainin Consultants, Inc., Mt. Vernon, WA	
LCS: 310:20:000	
TRANSITION TO TOTAL QUALITY—A CASE STUDY	258
Michael P. Charness , Director of TQM, Thiokol Corp., Huntsville Div., Huntsville, AL	
LCS: 020:10:000	

1.2.6 Inspection

PAPERLESS DATA SYSTEM FOR THE SPACE SHUTTLE RE-ENTRY SYSTEM	265
James D. Tostenson , Product Assurance Manager, Lockheed Missiles & Space Co., Inc., Sunnyvale, CA	
LCS: 740:70:439	
AUTOMATING THE INSPECTION REPORTING PROCESS	272
Robert M. Rayne , Manager, Quality Engineering, Martin Marietta A&NS, Glen Burnie, MD	
LCS: 310:70:436	
INSPECTION (MALIGNED, MISUNDERSTOOD, AND MISUSED)	278
Lawrence G. Picard Sr. , Nuclear Quality Control Manager, Charleston Naval Shipyard, Charleston, SC	
LCS: 760:70:434	

1.2.7 Human Resources

EMPLOYEE EMPOWERMENT: A PROFILE OF GEAUGA COMPANY	282
Ashton Ogle , Quality Engineer, Geauga Company, Crestline, OH	
LCS: 330:80:430	
THE EXPANDED ROLE OF HR MANAGEMENT IN QUALITY MANAGEMENT	288
Donald Jastrebski , Manager, John Campbell , Senior Consultant, Andersen Consulting, Chicago, IL	
LCS: 330:10:400	
QUALITY LINKAGES	295
Les Wollschlaeger , Supplier Quality Manager, Siltec Silicon, Salem, OR	
LCS: 670:90:000	

1.2.8 Statistics

THE EVOLUTION OF A SYSTEM FOR TEACHING EVOP	302
Thomas B. Barker , Associate Professor, Center for Quality and Applied Statistics, Rochester Institute of Technology, Rochester, NY	
LCS: 526:60:000	
AUDITS “NUCLEAR STYLE”	311
John Hathaway , Consulting Engineer, Cygna Energy Corp., Div. of ICF International, Fairfax, VA	
LCS: NONE	
A MANAGEMENT PROCEDURE FOR DESIGN OF EXPERIMENTS	317
L.K. Chan , Department of Statistics, The University of Manitoba, Winnipeg, Manitoba, Canada	
E.H. Gan , Intel Technology Sdn. Bhd., Penang, Malaysia	
T.K. Mak , Department of Decision Sciences & Management Information Systems, Concordia University, Montreal, Quebec, Canada	
LCS: 522:70:400	

1.2.9 Quality Management	
ISO 9002 REGISTRATION IN A MINING ENVIRONMENT	325
Robert Kelly , Director of Quality Assurance, Iron Ore Co. of Canada, Labrador City, Newfoundland, Canada LCS: 020:70:210	
A POLITICAL PLATFORM FOR QUALITY IMPROVEMENT	332
Spencer B. Graves , Spencer Graves Associates, San Jose, CA LCS: 020:10:900	
DON'T LET YOUR CUSTOMERS FOOL YOU	339
Hollis R. Lipscomb , Managing Partner, John R. Lipscomb , President, John R. Lipscomb & Associates, White Lake, MI LCS: 300:50:800	
2.1.1 Aviation, Space & Defense	
cmi: HUGHES' APPROACH TO BEING A WORLD CLASS COMPANY	346
Carl A. Butts , Quality Director, Yash P. Manchanda , Project Manager, Hughes Aircraft Company—EDSG, El Segundo, CA LCS: 020:10:438	
THE RAINBOW SHIFT: A CONTROL CHART FOR SHORT RUNS	353
Mary R. Anderson , Associate Professor of Engineering, Department of Industrial and Management Systems Engineering, Arizona State University, Tempe, AZ LCS: 110:70:439	
TOTAL QUALITY REDEPLOYMENT	360
(Contingency Planning for Enlightened Leadership) Douglas A. Lishka , Total Quality Project Manager, Northrop Corp., B-2 Div., Pico Rivera, CA LCS: 670:10:000	
2.1.2 Chemical & Process Industries	
TWIN METRIC CONTROL—IMPROVING SPC TO MEET SUPPLY CHAIN REALITIES OF THE 1990s	367
Donald W. Marquardt , Donald W. Marquardt and Associates, Wilmington, DE Dana L. Ulery , Du Pont Co., Wilmington, DE LCS: 100:00:000	
SPLIT PLOTTING AND RANDOMIZATION IN INDUSTRIAL EXPERIMENTS	374
James M. Lucas , Senior Consultant, Du Pont Co., Wilmington, DE Huey L. Ju , University of Delaware, Newark, DE LCS: 521:20:400	
2.1.3 Electronics	
A PRIMER ON PRODUCT LIABILITY	383
Richard M. Jacobs , Consultant Services Institute, Inc., Livingston, NJ LCS: 354:600:10:70:099	
HOW CAPABLE IS YOUR ELECTRICAL TEST?	390
Susan P. Spurgeon , Sr. Program Leader Harlan C. Cramer , Adam Zahorchak, Senior Engineers, Westinghouse ATD, Baltimore, MD LCS: 770:70:436	
SPC AND COMPUTER AUTOMATED TEST SYSTEMS	396
Albert I. Flori and Sherry K. Walters , Senior QE Statisticians, Motorola Codex, Mansfield, MA LCS: 123:70:439	

2.1.4 Measurement Quality	
QUALITY PLANNING FOR A PRECISION MACHINING PROCESS	405
Edward K. Huttunen , Senior Quality Engineer, General Electric Appliances, Columbia, TN	
LCS: 123:70:434	
VARIANCE COMPONENTS IN MEASUREMENT ASSURANCE STUDIES	412
Joseph R. Troxell , Associate Professor, La Salle University, Philadelphia, PA	
LCS: 700:70:000	
MEASUREMENT VARIATION: A NONMANUFACTURING CASE	419
Joseph D. Conklin , TQC Statistician, ALCOA Warrick Operations, Newburgh, IN	
LCS: 750:70:438	
2.1.5 Quality Management	
RESULTS AND CONCLUSIONS FROM APPLYING TQM TO RESEARCH	426
Al C. Endres , Vice President, Juran Institute, Inc., Wilton, CT	
LCS: 310:60:000	
TOTAL QUALITY CONTROL—A CASE STUDY	431
David A. Buhner , Quality Manager, Plastics Packaging Products Co., Muncie, IN	
LCS: 310:20:430	
COMMUNITY QUALITY COUNCILS: A PRACTICAL MODEL	437
J.M. Toney Jr. , Tradecraft Ltd., Williamsburg, VA	
N. Wayne Perry , Hampton Roads QM Council, Inc., Newport News, VA	
LCS: 310:10:886	
2.1.6 Puerto Rico	
YIELD IMPROVEMENT THROUGH SPC AND DOE	444
Jose L. Zayas-Castro , Associate Professor-I.E. Dept., UPR-RUM, Mayaguez, Puerto Rico	
Victor J. Mundo-Garcia , Graduate Student-I.E. Dept., UPR-RUM, Mayaguez, Puerto Rico	
LCS: 524:20:400	
TUNA CANNING IMPROVEMENT THROUGH DOE, SPC	451
Rosa M. Espino-Ramirez , Instructor, Caribbean University College, Bayamon, Puerto Rico	
Jack T. Allison , Professor and Dept. Head, Department of Industrial Engineering, University of Puerto Rico, Mayaguez, Puerto Rico	
LCS: 310:70:420	
OPTIMAL ESTIMATION FOR PIECEWISE REGRESSION MODELS	458
Nazario D. Ramirez-Beltran , Department of Industrial Engineering, University of Puerto Rico, Mayaguez, Puerto Rico	
LCS: 542:60:428	
2.1.7 Human Resources	
THE LEARNER AS CUSTOMER: QFD-DESIGNED EDUCATION	465
Marcia C. Guzy , Educational Consultant, Digital Equipment Corp., Maynard, MA	
LCS: 660:80:436	
NEW WAYS OF THINKING: KNOWLEDGE AND TOTAL QUALITY	472
Helene F. Uhlfelder , Senior Consultant, The Miller Consulting Group, Inc., Atlanta, GA	
LCS: 670:90:000	
TRAINING ACROSS THE LANGUAGE GAP	479
Annabeth L. Propst , Quality Transformation Services, Rockford, IL	
LCS: 323:00:000	

2.1.8 Statistics	
REAL-TIME STATISTICAL QUALITY CONTROL AND ARM	484
David K. Blough, Senior Research Scientist, Pacific Northwest Laboratory, Richland, WA	
LCS: 545:70:991	
A CRITIQUE AND ENHANCEMENT OF THE TAGUCHI METHOD	491
John S. Ramberg, Systems and Industrial Engineering, University of Arizona, Tucson, AZ	
Joseph J. Pignatiello Jr., Industrial Engineering, Texas A&M University, College Station, TX	
Susan M. Sanchez, Decision Sciences, University of Arizona, Tucson, AZ	
LCS: 520:70:400	
2.2.1 Aviation, Space & Defense	
QUALITY RESULTS IN R&D	499
Gail L. Willette, Quality Specialist, Sandia National Laboratories, Albuquerque, NM	
LCS: 610:70:991	
THE APPLICATION OF QFD TO A NATIONAL SECURITY ISSUE	506
Greg A. Mann, Laura L. Halbleib, Quality Engineers, Sandia National Laboratories, Albuquerque, NM	
LCS: 610:70:991	
2.2.2 Chemical & Process Industries	
SPC TRAINING AND DECISION MAKING WITH OC CURVES	513
Clarence R. Burns, Quality Methods Manager, Fisher Controls Int., Inc., Marshalltown, IA	
LCS: 111:70:000	
STATISTICAL KNOWLEDGE IMPROVES THE VALUE OF AUDIT "WHEN TO SAY WHEN" .	518
Gary G. Griffin, Manager, Manufacturing Quality Engineering	
Jeffrey S. Solomon, Statistician, BFGoodrich Aerospace, Simmonds Precision Aircraft Systems, Vergennes, VT	
LCS: 345:70:439	
MULTI PARAMETER ANALYSIS CHART (MPAC)	524
Subhash C. Singhal, Distinguished Member of Technical Staff, AT&T Bell Labs, Mesquite, TX	
LCS: 123:70:000	
2.2.3 Electronics	
IMPROVING RESEARCH USING TOTAL QUALITY MANAGEMENT	531
Jerry D. Holmes, Vice President, Research, David J. McClaskey, Quality Management Coordinator, Eastman Chemical Co., Kingsport, TN	
LCS: 600:10:000	
IMPLEMENTING SIX SIGMA FOR INTERCONNECT TECHNOLOGY	538
John Noguera, Torben Nielsen, J.G. Noguera & Associates, Kanata, Ontario, Canada	
LCS: NONE	
CONFIDENCE INTERVALS: EXPLANATIONS AND ALTERNATIVES	545
Dale O. Richards, Professor, Brigham Young University	
LCS: 410:00:000	
2.2.4 Reliability	
A QFD APPROACH TO INTEGRATED TEST PLANNING	552
Ruth L. Bardenstein, Supervisor, Quality, Risk, Reliability Analysis, TASC, Troy, MI	
Gregory J. Gibson, Manager, Reliability and Quality Engineering, TASC, Reading, MA	
LCS: 850:60:000	

THE MODULATED POWER LAW PROCESS	559
Mary J. Lakey, McDonnell Aircraft Co., St. Louis, MO	
Steven E. Rigdon, Southern Illinois University at Edwardsville, Edwardsville, IL	
LCS: 824:70:400	
2.2.5 Quality Management	
POLICY DEPLOYMENT: A KEY TO TQM IMPLEMENTATION	564
Lynn Bishop-Gains, The Forum Corp., Boston, MA	
LCS: 310:10:000	
TOTAL QUALITY MANAGEMENT IN THE FURNITURE INDUSTRY	570
Victor F. Maya, Director of Quality Assurance, Henredon Furniture Industries, Morganton, NC	
Charles D. Carpenter, Senior Associate, Manufacturing Consulting, Coopers & Lybrand, Boston, MA	
LCS: 310:70:425	
QUALITY AND INNOVATION AT 3M: A PARTNERSHIP FOR CUSTOMER SATISFACTION	577
Robert E. Gubrud, James J. Thompson, Managers, 3M, Quality Management Serv.	
Ronald H. Kubinski, Manager, 3M, Corporate Quality, St. Paul, MN	
LCS: 600:10:000	
2.2.6 Education	
QUALITY EDUCATION AND RESEARCH ARE NOW POSSIBLE IN BRAZIL	584
Edgard P. de Cerqueira Neto, Quality Management Professor, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil	
LCS: 320:70:882	
EQUIPPING THE CORPORATION FOR TQM	591
Jim M. Edge, Manufacturing System Engineer, Dixie Yarns, Inc., Chattanooga, TN	
LCS: 320:90:400	
POLICY DEPLOYMENT: AVOIDING THE "CRISIS OF DISTRACTION"	599
Ruth M. Hawkins, Senior Technical Specialist—Total Quality Management, Engineering Division, McDonnell Aircraft Co., St. Louis, MO	
LCS: 310:10:400	
2.2.7 Human Resources	
PROCEDURE MANUALS: A PRACTICAL APPROACH TO ON-THE-JOB TRAINING	606
Robert C. Starkweather, Vice President—Quality, Lone Star Heat Treating Inc., Houston, TX	
LCS: 323:10:00	
THE KNOWLEDGE NETWORK: DECENTRALIZE QUALITY LEARNING	613
Lilly Platt, Senior Consultant, Arthur Granville, Program Manager, Digital Equipment Corp., Maynard, MA	
LCS: 320:00:000	
MEASURING PROGRESS TOWARD QUALITY EXCELLENCE	620
Robert P. Steel, Air Force Institute of Technology, Wright-Patterson AFB, OH	
Kenneth R. Jennings, The Pacer Group, Dayton, OH	
LCS: 710:10:000	
2.2.8 Statistics	
MISLEADING SIGNALS; XBAR & R CHARTS vs EWMA CHARTS	627
Ralph C. St. John and Daniel J. Bragg, Bowling Green State University, Bowling Green, OH	
LCS: 111:70:000	

CONCURRENT ENGINEERING OF A SERVICE ORDER PROCESS	634
Jim Pennell, John Stepper, Dan Petrozzo, Research Staff Members, AT&T Bell Laboratories,	
Red Hill, NJ	
LCS: 640:60:548	
PROCESS OPTIMIZATION FOR MULTI-ATTRIBUTED PRODUCTS	642
David P. Stevens, Senior Computing Engineer, Bell Helicopter Textron, Fort Worth, TX	
Revenor C. Baker, Professor, University of Texas at Arlington, Arlington, TX	
LCS: 500:70:439	
2.3.1 Construction	
SUPPLIER DEVELOPMENT FOR THE 21ST CENTURY	649
Richard A. Gould, Manager, Supply Quality, Western Digital Corp., Irvine, CA	
LCS: 351:40:436	
QUALITY MEASUREMENT IN ENGINEERING AND CONSTRUCTION	655
Roger D. Hart, Director, Quality Assurance, Fluor Daniel, Inc., Irvine, CA	
LCS: 310:70:300	
TODAY'S "TOTAL QUALITY" CHALLENGE ON MAJOR CONSTRUCTION PROJECTS	661
John P. Jackson, Vice Chairman, Management Analysis Co., San Diego, CA	
LCS: NONE	
2.3.2 Energy	
QUALITY IMPLICATIONS OF THE GREENING OF ENERGY SUPPLY	669
Bryan W. Gladstone, Professor, Business Policy	
David S. Morris, Professor, Political Science	
Robert H. Haigh, Professor, Political Studies, Sheffield Business School, Sheffield, UK	
LCS: 010:00:549	
TQM: PUTTING THE ENERGY BACK INTO THE ENERGY BUSINESS	677
Rocky R. Romero, Texaco Exploration & Production Inc., New Orleans, LA	
Jennifer M. Howard, Miller Consulting Group, Atlanta, GA	
LCS: 020:10:213	
2.3.3 Environmental	
TQM IN THE CLEAN AIR ACT	684
Ronald L. Berglund, Pollution Prevention Manager, Brown & Root, Inc., Houston, TX	
LCS: 710:90:428	
AUDITING ENVIRONMENTAL DATA SYSTEMS	692
Jeffrey C. Worthington, Director of Quality Assurance	
Stephen A. Coll, Staff Associate, TechLaw, Inc., Lakewood, CO	
LCS: 345:70:000	
2.3.4 Reliability	
RELIABILITY ANALYSIS DURING OPERATION DESERT STORM	706
Terry A. DeWitt, Senior Reliability Engineer, U.S. Army Combined Arms Support Command,	
Fort Knox, KY	
Richard W. Price, Eastern Regional Manager,	
U.S. Army Combined Arms Support Command, Fort Lee, VA	
LCS: 800:60:991	
EVALUATING DESIGN SENSITIVITY USING DOE AND SIMULATION	711
George Koons, Steve Meyer, and Mark Kurowski, Motorola Lighting, Inc., Buffalo Grove, IL	
LCS: 840:70:436	

2.3.5 Quality Management	
CREATING AND IMPLEMENTING THE TOTAL QUALITY PIPELINE	718
Barry K. Spiker, Alan L. Chamberlain, John R. Sutton, Managers	
Richard C.H. Chua, Jeffrey R. Larson, Senior Consultants	
Andersen Consulting, Minneapolis, MN	
LCS: 300:70:400	
2.3.6 Food, Drug & Cosmetic	
QUALITY-RELATED EDUCATION IN FOOD PROCESSING	734
Lisa L. Crozier, Project/Curriculum Writer, Northeast Wisconsin Technical College, Green Bay, WI	
LCS: 320:90:420	
DEVELOPMENT OF TOLERANCE LIMITS FOR AN INDUSTRY—ETHYLENE OXIDE	
STERILIZATION OF MEDICAL DEVICES	741
Dale A. Madden, Operations Research Analyst, Office of Planning and Evaluation, Food and Drug Administration, Rockville, MD	
LCS: 552:70:439	
MULTIFUNCTIONAL TEAM APPROACH TO FOOD PLANT DESIGN	748
John G. Surak, Professor of Food Science, Clemson University, Department of Food Science, Clemson, SC	
Kathleen A. Henning, Integrated Manufacturing Consultant, CRS Sirrine Engineering, Inc., Greenville, SC	
LCS: 620:20:420	
2.3.7 Human Resources	
INTEGRATED APPROACH TO CONTINUOUS IMPROVEMENT	755
Kenneth Vlach, Manager, Quality and Safety	
John Martin, Manager, Quality Systems, Xerox Corp., Webster, NY	
LCS: 310:70:439	
REWARD AND RECOGNITION IN A TQM ENVIRONMENT	762
Mary Ann Russo, Mark E. Snyder, Digital Equipment Corp., Stow, MA	
LCS: 670:10:000	
INCREASING SENIOR MANAGEMENT'S COMMITMENT TO TQM: A COMMUNICATION MODEL	769
Joan F. Pastor, Joan Pastor and Associates, Oceanside, CA	
LCS: 670:10:000	
2.3.8 Statistics	
REPORT OF THE DEMING STUDY GROUP (III)	779
Maureen S. Henry, The Transformation Network, Inc., West Bloomfield, MI	
LCS: 320:10:882	
2.4.1 Software	
TOTAL QUALITY STARTUP IN AN A/E'S REGIONAL OFFICE	802
Warren E. Thomas Jr., Steven B. Davis, Michael P. Tulay, Project Managers	
Gilbert/Commonwealth, Inc., Oak Ridge, TN	
LCS: 310:90:300	

ON-LINE PROBLEM REPORTING SUPPORTS TOTAL QUALITY	808
Sara Decker, Systems Analyst, Boeing Defense and Space Group, Product Support Division, Wichita, KS	
LCS: 730:70:437	
IMPROVING MANAGEMENT THROUGH STATISTICS	814
Jackie D. Graham, PQ Systems, Inc., Melbourne, Australia	
Michael J. Cleary, Wright State University, Dayton, OH	
LCS: 310:10:000	
2.4.2 Energy	
MAKING A DIFFERENCE IN ENVIRONMENTAL CLEANUP—APPLYING TQM IN DOE	821
Daniel Lillian, Chief, Laboratory Management Branch, U.S. Department of Energy, Washington, D.C.	
LCS: 300:90:991	
QUALITY AND ENVIRONMENTAL PROTECTION: THE EPA QA PROGRAM	828
Gary L. Johnson, Nancy W. Wentworth, U.S. Environmental Protection Agency, Quality Assurance Management Staff, Washington, D.C.	
LCS: 300:90:991	
MAKING A DIFFERENCE IN ENVIRONMENTAL CLEANUP—APPLYING TQM: OVERVIEW ..	835
Stanley M. Blacker, Vice President—Environment, MAC Technical Services Co., Alexandria, VA	
LCS: 300:90:900	
2.4.3 Quality Auditing	
TOTAL QUALITY FITNESS REVIEWS—LESSONS LEARNED	843
Andrew H. West, Manager, Management Systems Assessments, Westinghouse Electric Corp., Baltimore, MD	
LCS: 020:90:436	
AUDITING STATISTICAL METHODS FOR ISO 9001	849
Gordon E. Smith, Department of Production Technology, Massey University, Palmerston North, New Zealand	
LCS: 345:70:000	
WRITING AUDIT FINDINGS: BE REASONABLE!	855
Nancy W. Girvin, Lead Auditor, Pacific Northwest Laboratory, Richland, WA	
LCS: 345:70:991	
2.4.4 Reliability	
EQUIVALENCY OF TWO POPULAR RELIABILITY ESTIMATORS	863
Gary S. Wasserman, Isanaka Sreenivasulu Reddy, Department of Industrial and Manufacturing Engineering, Wayne State University, Detroit, MI	
LCS: 824:60:400	
FAILURE ANALYSIS IN TODAY'S QUALITY SYSTEM	869
Roger L. Franz, Motorola Inc., Automotive and Industrial Electronics Group, Northbrook, IL	
LCS: 840:70:436	
2.4.5 Quality Management	
TECHNICAL PROBLEM SOLVING STRATEGIES, A CASE STUDY	876
Richard Shainin, Shainin Consultants, Inc., Vienna, VA	
LCS: 020:70:433	
KEY MEASURES FOR THE CHIEF QUALITY OFFICER	883
Thomas Fairbrother, Lynda Hunn, Quality Systems Assurance, Bausch & Lomb Eyewear Division, Rochester, NY	
LCS: 670:70:438	
PROFITABLY MANAGING AN ORGANIZATION TO SURVIVE . . LONG RUN	889
James E. Walters, Professor of Management, Department of Management, Ball State University, Muncie, IN	
George W. Brutchen, Senior Project Engineer, Delco Remy Division, General Motors Corp., Anderson, IN	
LCS: 630:10:000	

2.4.6 Biomedical	
QUALITY ASSURANCE FOR MONOCLOINAL ANTIBODIES	896
<i>Jean F. Huxsoll</i> , Senior Director, Manufacturing	
<i>Kip L. Kjellesvig</i> , Supervisor, Protein Purification, Applied Immune Sciences, Inc., Menlo, CA	
LCS: 300:20:439	
USING THE THEORY OF RUNS IN A BIOMEDICAL APPLICATION	903
<i>Steven M. Zimmerman</i> , University of South Alabama	
<i>Lonnie D. Brown, Shannon S. Brown</i> , University of South Alabama Medical Center	
<i>Robert N. Zimmerman</i> , Biomedical Quality Control of America, Inc., Mobile, AL	
LCS: 111:70:880	
2.4.7 Standards (Repeat of session 3.1.2 Standards)	
2.4.8 Statistics	
PRAGMATIC KNOWLEDGE AND ITS APPLICATION TO QUALITY	909
<i>Michael R. Lovitt</i> , Provost Consulting Group, Inc., Austin, TX	
LCS: 680:00:099	
QUALITY TOPICS IN THE BUSINESS SCHOOL CURRICULUM	916
<i>David P. Doane</i> , Department of Decision and Information Sciences, School of Business Administration, Oakland University, Rochester, MI	
LCS: 000:10:882	
CONTENT AND METHODOLOGY FOR A COURSE IN EXPERIMENTAL DESIGN	922
<i>Don Benbow</i> , Engineering and Mathematics, Marshalltown Community College, Marshalltown, IA	
<i>Roger Berger</i> , Industrial and Manufacturing Systems Engineering, Iowa State University, Ames, IA	
LCS: 522:60:882	
3.1.1 Software	
A CONTINUOUS IMPROVEMENT STRATEGY FOR SOFTWARE	926
<i>Thomas Pyzdek</i> , University of Arizona, Department of Management and Policy, Tucson, AZ	
LCS: 710:60:099	
SOFTWARE RELIABILITY MODELING	933
<i>Michael A. Elbert</i> , Consulting Engineer, Systems Engineering	
<i>Richard C. Howe</i> , Manager, Systems Engineering	
<i>Thomas F. Weyant</i> , Manager, Quality and Reliability, Digital Equipment Corp., Tewksbury, MA	
LCS: 840:60:000	
3.1.2 Standards	
THE IMPACT OF THE ISO 9000 STANDARDS ON COUNTRIES WORLDWIDE	941
<i>Malcolm Phipps</i> , Director of Registration, Quality Management Institute, Mississauga, Ontario, Canada	
<i>Harrison M. Wadsworth</i> , Professor Emeritus, Georgia Institute of Technology, Atlanta, GA	
LCS: 020:70:889	
3.1.3 International	
A QUALITY PROGRAM FOR THE BRAZILIAN CHEMICAL INDUSTRY	945
<i>B.V. Dagnino</i> , Consultant, Gestao ISO de Qualidade, Rio de Janeiro, Brazil	
LCS: 310:00:428	
SPC IN NON-MANUFACTURING—APPLICATIONS AND OPPORTUNITIES	950
<i>Mal Owen</i> , Training for Excellence, Bristol, U.K.	
LCS: 110:10:000	

3.1.4 Quality Costs	
YOU HAVE COST OF QUALITY PROGRAM, SO WHAT!	957
<i>Alfred Ponte, Consultant, Wichita, KS</i>	
LCS: 353:10:439	
GOING FOR THE BALDRIGE GOLD	964
<i>Norman L. Naidish, President, Vision Management Associates, Augusta, NJ</i>	
LCS: 310:10:000	
3.1.5 Quality Management	
TEAM QUALITY AWARDS FOR THE ENTIRE COMMUNITY	972
<i>James H. Brown, Manager, Corporate Quality Improvement, Lord Corp.</i>	
<i>James Orcutt, Erie, PA</i>	
LCS: 310:00:000	
A HEALTH CARE QUALITY REVOLUTION: HOW TO CERTIFY SUPPLIERS	979
<i>M. Daniel Sloan, President, Quality Health Systems of America, Inc., Seattle, WA</i>	
LCS: 351:70:880	
FOCUSING ON RELIABILITY IN AN R&D ENVIRONMENT—USING KNOWLEDGE TO OBTAIN COMMITMENT, RESPONSIBILITY, AND REWARD	985
<i>Judith A. Malsbury and James B. Graham, Princeton Plasma Physics Laboratory, Princeton University, Princeton, NJ</i>	
LCS: 310:70:000	
3.1.6 Health Care	
BUILDING IMPROVEMENT INTO HEALTH CARE AND SERVICE	992
<i>Marianne Murdock, Director, Systems and Quality Engineering, University of Virginia Health Sciences Center, Charlottesville, VA</i>	
LCS: 020:70:880	
HOSPICE NURSING QUALITY: EVALUATING CONSUMER SATISFACTION	999
<i>Lucille I. Grimm, Associate Professor of Nursing, Kirkhof School of Nursing, Grand Valley State University, Allendale, MI</i>	
LCS: 310:70:880	
EMS-Q: IMPROVING EMERGENCY MEDICAL SERVICE QUALITY	1006
<i>James A. Alloway Jr., AEMT-I, Department of Mechanical and Aerospace Engineering, Manufacturing Engineering Program, Syracuse University, Syracuse, NY</i>	
LCS: 020:70:880	
3.1.7 Human Resources	
SPORTS—THE EMPOWERMENT MODEL EVERYONE CAN UNDERSTAND	1013
<i>Donald E. Schenck, Director of Manufacturing Engineering, Siemens Industrial Automation, Inc., Johnson City, TN</i>	
LCS: 670:80:436	
PEAK PERFORMERS IN AN EMPOWERING QUALITY CULTURE	1021
<i>Wayne C. Shannon, Vice President—Quality Improvement Process, Dobbs International Services, Inc., Memphis, TN</i>	
LCS: 010:10:889	
INSTITUTIONALIZING TOTAL QUALITY: A CHALLENGE	1024
<i>Davida M. Amsden, Huber Heights, OH</i>	
<i>Robert T. Amsden, MIS & Decision Sciences, University of Dayton, Dayton, OH</i>	
LCS: 300:10:000	

3.1.8 Statistics

A SIMPLE METHOD FOR ESTIMATING PROCESS SPREAD	1030
Richard M. Goodson, Quality Assurance Manager, Johnson Controls, Inc., Watertown, WI	
LCS: 420:70:000	
THE EFFECT OF INSTABILITIES ON ESTIMATES OF SIGMA	1037
Arved J. Harding Jr., Kwan R. Lee, and Jennifer L. Mullins, Eastman Chemical Co., Kingsport, TN	
LCS: 111:70:439	
WHITE COLLAR STATISTICAL PROCESS CONTROL	1044
Earl M. Mustonen, Director, Quality Operations	
Ronald W. Asher, Program Management Specialist,	
General Dynamics Land Systems, Sterling Heights, MI	
LCS: 344:10:419	

3.1.9 Quality Management

QUALITY—THE TOOL TO SURVIVING A RECESSION	1051
Elizabeth A. Blieschke, Senior Consultant, South Australian Centre for Manufacturing, Woodville, SA	
Geoffrey J. Warner, Manager, Quality Improvement, State Bank of SA, Adelaide, SA, Australia	
LCS: 310:90:700	
A QUALITY CONTROL PLAN FOR NON-PREVENTIVE MAINTENANCE	1057
Mohan G. Israni, Director, Quality Control, Division of Electrical Systems,	
New York City Transit Authority, New York, NY	
LCS: 300:70:876	
TOTAL QUALITY MANAGEMENT IN THE U.S. HOME	1064
Linda D. Feres, Quality Assurance Manager, Amtec Corp.	
Gary O. Feres, Quality Engineering Supervisor, Unisys Corp., Huntsville, AL	
LCS: 310:10:000	

3.2.1 Software

CERTIFYING SOFTWARE PRODUCTS, PROCESSES, PERSONNEL	1070
Taz Daughtrey, B&W Space & Defense Systems, Lynchburg, VA	
LCS: 300:70:000	
A CUSTOMER SERVICE APPROACH TO SOFTWARE QUALITY	1077
John E. Lowe, Senior SQA Analyst	
Bruce Jensen, Quality Assurance Manager, Litton Computer Services, Dayton, OH	
LCS: 300:70:000	
A PERSPECTIVE ON SOFTWARE PROCESS IMPROVEMENT	1084
David N. Card, Computer Sciences Corp., Calverton, MD	
LCS: 310:70:873	

3.2.2 Standards

THE ABCs OF IMPLEMENTING ISO 9000	1091
Subhash C. Puri, Chief Statistician, Agriculture Canada, Ottawa, Ontario, Canada	
LCS: NONE	
ISO 9002! HOW WE ACHIEVED REGISTRATION	1098
John Stephens, Director, Corporate Operations Quality Assurance,	
Newbridge Networks Corp., Kanata, Ontario, Canada	
LCS: 020:10:000	
REFLECTIONS: LIFE BEYOND ISO 9000 REGISTRATION	1103
Robert Joseph Craig, Quality Assurance Manager, DuPont Electronics, Clearfield, PA	
LCS: 020:10:400	

3.2.3 International	
A LETTER FROM EUROPE TO A QUALITY MANAGER	1110
Asbjorn Aune, Professor, Dept. of Production Engineering, Norwegian Institute of Technology, Trondheim, Norway	
LCS: 300:70:099	
PERFORMANCE OPTIMIZATION: A PHASED APPROACH	1118
T.N. Goh, Professor, Industrial & Systems Engineering Dept., National University of Singapore, Singapore	
LCS: 520:10:400	
G'DAY! AUDIT TAMES AUSSIE ROADS	1125
Bruce J. Peters, Director, The Consultancy-Q Force, Brisbane, Australia	
LCS: 330:90:994	
3.2.4 Quality Costs	
COST-OF-QUALITY TECHNIQUES FOR BUSINESS PROCESSES	1131
Tien-fang Hou, Consultant, Quality Process Center, AT&T Bell Laboratories, Holmdel, NJ	
LCS: 350:00:000	
MOVING BEYOND THE NUMBERS: QUALITY IN AN INSURANCE COMPANY	1138
Michele T. Redman, Director, Corporate Quality Department, ITT Hartford Insurance Group, Hartford, CT	
LCS: NONE	
PROBLEM BASED QUALITY COSTING FOR TQM PROGRESS MEASUREMENT	1144
Jim Robison, Vice President, Quality Cost Applications, The Carman Group, Inc. Richardson, TX	
LCS: 353:10:439	
3.2.5 Quality Management	
"EACH ONE TEACHES ONE" IN TQ APPLICATIONS	1150
Marcia R. Boyd, Total Quality Manager	
Claude F. Haraway, Assistant Director, HRD, Management Development	
Joan G. Freeman, Supervisor, Blood Bank, Baptist Memorial Hospital, Memphis, TN	
LCS: 320:10:880	
ISO 9000—A REGISTRAR'S PERSPECTIVE	1156
Heinz Rosen, Manager, International Inspection Services—West, Underwriters Laboratories, Inc., Melville, NY	
LCS: 310:340:70:099	
AVERTING A REVERSAL OF TQM	1161
Kersi F. Munshi, Senior Analyst, Florida Power & Light, Miami, FL	
LCS: 300:10:000	
3.2.6 Quality Auditing	
AUDIT UNTO OTHERS	1170
Joseph H. Maday Jr., Technical Group Leader—Quality Verification Dept., Pacific Northwest Laboratory, Richland, WA	
LCS: 345:70:991	
MEASURING INTANGIBLES: TOTAL QUALITY CULTURE IN TECHNICAL PUBLICATIONS	1176
Roger M. Helm, Senior Technical Writer, Siemens Industrial Automation, Inc., Johnson City, TN	
LCS: 345:90:427	
ISO 9000—AUDITING THE CONFORMANCE PROCESS	1182
David D. Kildahl, Schneider US Stent Division, Plymouth, MN	
LCS: NONE	

3.2.7 Human Resources

THE PURSUIT OF QUALITY THROUGH PERSONAL CHANGE	1188
<i>Harry I. Forsha</i> , Business Systems Manager, Tampa Armature Works, Tampa, FL	
LCS: NONE	
A CUSTOMER-DRIVEN APPROACH FOR MEASURING SERVICE QUALITY	1195
<i>Richard C.H. Chua</i> , Senior Consultant, Andersen Consulting, Minneapolis, MN	
LCS: 710:70:800	
THE HUMAN RESOURCE ASPECTS OF QUALITY IMPROVEMENT	1202
<i>G. Peter Hillman</i> , Director, TQM International Ltd., Cheshire, England	
LCS: 680:80:000	

3.2.8 Statistics

USING STATISTICAL TOOLS TO MEET THE CHALLENGE	1209
<i>Michael J. Mazu</i> , ALCOA Corp., Warrick Operations, Newburgh, IN	
LCS: 523:70:000	
USE OF PROBABILITY PLOTS IN ANALYZING EXPERIMENTS	1215
<i>Robert F. Brewer</i> , Consultant, Industrial Design & Engineering Associates, Lakeville, PA	
LCS: 523:00:000	
THE ROLE OF PURE ERROR ON NORMAL PROBABILITY PLOTS	1223
<i>Patrick J. Whitcomb</i> , President, Stat-Ease, Inc., Minneapolis, MN	
<i>Kinley Larntz</i> , Professor, Dept. of Applied Statistics, University of Minnesota, St. Paul, MN	
LCS: 522:00:000	

STANDBY PAPERS

COMPUTER PROGRAMS FOR THE QUALITY DEPARTMENT	1230
<i>John M. Cachat</i> , President, IQS, Inc., Cleveland, OH	
LCS: 020:70:099	
TOTAL QUALITY IN HR—HOW TO SHIFT OLD-WAY THINKING	1238
<i>Craig Nathanson</i> , HR Total Quality Manager, Intel Corp., Santa Clara, CA	
LCS: 680:10:000	
WHAT IS ISO 9000?	1244
<i>Leonard Ferrier</i> , Ferrier & Associates, San Jose, CA	
LCS: 342:70:000	
VISION—THE MISSING FACTOR IN THE QUALITY EQUATION	1248
<i>Ivan G. Thompson</i> , Quality Support Staff, Air Force Communications Command, HQ AFCC/SA, Scott AFB, IL	
LCS: 310:10:000	

